101519996



# PATENT COOPERATION TREATY

# **PCT**

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

|   | 10/519978   | PCT/FP2003/00  |
|---|---|--|
| INSTATIONAL INTERNATIONAL                                       | NT COOPERATION T  | REATY  |
| elatio.   | PCT   |  |
| INTERNATIONA  | L PRELIMINARY EXAM  | IINATION REPORT  |
|   | (PCT Article 36 and Rule 7  |  |
| Applicant's or agent's file reference P800310/WO/1              | R FURTHER ACTION See 1  | Notification of Transmittal of International inary Examination Report (Form PCT/IPEA/416           |
| International application No. PCT/EP2003/005272                 | national filing date (day/month/ye<br>20 May 2003 (20.05.2003)  | ar) Priority date (day/month/year) 05 July 2002 (05.07.2002)                                       |
| International Patent Classification (IPC) or national H01M 8/06 | d classification and IPC  |  |
| Applicant   | DAIMLERCHRYSLER AC  | }  |
| I I I and one the begge for thi                                 | y ANNEXES, i.e., sheets of the description and/or sheets containing the ninistrative Instructions under the | scription, claims and/or drawings which have be<br>ectifications made before this Authority (see R |
| Lack of unity of invent   | pinion with regard to novelty, inve   | entive step and industrial applicability  ovelty, inventive step or industrial applicability;      |
| VI Certain documents cite  VII Certain defects in the           | nis supporting such consensus   |  |
| Date of submission of the demand                                | Date of cor   | npletion of this report  |
| Date of submission of the definant  18 November 2003 (18.11     | .2003)  | . 05 April 2004 (05.04.2004)   |
| Name and mailing address of the IPEA/EP                         | Authorized  | i officer  |
| Name and maning address of the                                  | i   |  |

Form PCT/IPEA/409 (cover sheet) (July 1998)

International application No.

PCT/EP2003/005272

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

|             | egard to t   | he elements of the international application:*  |  |
|-------------|--|---|--|
|             |  | national application as originally filed  |  |
| ==          |  |   |  |
|             | the descr  |   | , as originally filed  |
|             |  | 1, 2, 5-11  | , filed with the demand  |
|             | pages _  | 3, 4, 4a , filed with the letter of   | 17 March 2004 (17.03.2004)   |
|             |  |   |  |
| $\boxtimes$ | the clain  |   | , as originally filed  |
|             | pages _  | , as amended (together  | with any statement under Article 19  |
|             |  |   |  |
|             | pages .  | 1-15, filed with the letter of  | 17 March 2004 (17.03.2004)   |
|             | pages .  | ,   |  |
| $\boxtimes$ | the draw   | 1/1   | , as originally filed  |
|             | pages  | 1/1   | , filed with the demand  |
|             | pages  | , filed with the letter of  |  |
|             | pages  | , med with the folial of  |  |
|             | the seque  | nce listing part of the description:  | , as originally filed  |
|             | pages  |   | , as originary fried,  |
|             | pages  |   | , med with the demand  |
|             | pages  | , filed with the letter of , filed with the letter of to the language, all the elements marked above were available or furnished to the language, all the elements marked above were available or furnished to the language.  |  |
|             | 1  | nguage of a translation furnished for the purposes of international search (under Finguage of publication of the international application (under Rule 48.3(b)).  |  |
| J. Wirpre   | the land the land or 55.  the regard diminary contains filed furnis furnis furnis The internal The   | nguage of publication of the international application (under Rule 48.3(b)).<br>nguage of the translation furnished for the purposes of international prelimina   | ry examination (under Rule 55.2 and national application, the international application ap |
| 3. Wilpre   | the land the land or 55.  the regard liminary contains filed furnism furnism The internal The been The Contains for the Contains for the Contains furnism Th | nguage of publication of the international application (under Rule 48.3(b)).  Inguage of the translation furnished for the purposes of international preliminar 3).  If to any nucleotide and/or amino acid sequence disclosed in the internet examination was carried out on the basis of the sequence listing: ined in the international application in written form.  It to gether with the international application in computer readable form. It is shed subsequently to this Authority in written form.  It is shed subsequently to this Authority in computer readable form. It is statement that the subsequently furnished written sequence listing does not national application as filed has been furnished.  It is that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification.  It is a statement that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification. It is a statement that the information recorded in computer readable form is identification.   | ry examination (under Rule 55.2 and national application, the international application and the international application and the disclosure in the call to the written sequence listing has   |
| 4           | the land the land or 55.  the regard liminary contains filed furnishing furnishing the land t | nguage of publication of the international application (under Rule 48.3(b)).  Inguage of the translation furnished for the purposes of international preliminar 3).  If to any nucleotide and/or amino acid sequence disclosed in the internet examination was carried out on the basis of the sequence listing:  ined in the international application in written form.  together with the international application in computer readable form.  shed subsequently to this Authority in written form.  shed subsequently to this Authority in computer readable form.  statement that the subsequently furnished written sequence listing does not national application as filed has been furnished.  statement that the information recorded in computer readable form is identic furnished.  amendments have resulted in the cancellation of:  the description, pages  the claims, Nos  the drawings, sheets/fig  report has been established as if (some of) the amendments had not been made and the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**   | ry examination (under Rule 55.2 and national application, the international application, the international application, the international application, the international application the disclosure in the call to the written sequence listing have been considered to  |
| 4           | the last the last or 55.  the regard forming contains furnism furnism furnism The internal The been The The been this reputation of this reputation of the property of the pro | nguage of publication of the international application (under Rule 48.3(b)).  Inguage of the translation furnished for the purposes of international preliminar 3).  If to any nucleotide and/or amino acid sequence disclosed in the international was carried out on the basis of the sequence listing:  ined in the international application in written form.  Itogether with the international application in computer readable form.  Itogether with the international application in computer readable form.  Itogether with the international application in computer readable form.  Itogether with the international application in computer readable form.  Itogether with the international application in computer readable form.  Itogether with the international application in computer readable form.  Itogether with the subsequently in written form.  Itogether with the international application in computer readable form.  Itogether with the subsequently furnished written sequence listing does in an actional application as filed has been furnished.  It will be a subsequence with the international application of:  It defends the international application in written form.  It will be a subsequently furnished.  It will be a subsequently furnished in the cancellation of:  It will be a subsequently furnished to the amendments had not been made and the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).  It will be a subsequently furnished to the receiving Office in response to an international application and are not annexed to this report since they do | ational application, the international application, the international application, the international application, the international application and the disclosure in the call to the written sequence listing has been considered to a vitation under Article 14 are referred to not contain amendments (Rule 70)   |

International application No.
PCT/EP 03/05272

|           | and the state of t |
|-----------|--|
| <b>7.</b> | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability  |
|           | citations and explanations supporting such statement   |

| Statement                     | •        |      |       |
|-------------------------------|----------|------|-------|
| Novelty (N)                   | Claims   | 1-15 | YES   |
|                               | Claims   |      | NO NO |
| Inventive step (IS)           | Claims   | 1-15 | YES   |
| mventive step (15)            | Claims   |      | NO NO |
| Industrial applicability (IA) | . Claims | 1-15 | YES   |
| industrial applications (21)  | Claims   |      | NO    |

### 2. Citations and explanations

#### 1. Documents

D1: WO 02 22234 A (DONALDSON CO INC) 21 March 2002 (2002-03-21)

D2: WO 02 054521 A (EMITEC EMISSIONSTECHNIK; POPPINGER MANFRED (DE); BRUECK ROLF (DE)) 11 July 2002 (2002-07-11)
D3: WO 01 03212 A (EMITEC EMISSIONSTECHNIK; KONIECZNY

JOERG ROMAN (DE); POPPINGER MAN) 11 January 2001 (2001-01-11)

D4: EP-A-0 476 610 (ISHIKAWAJIMA HARIMA HEAVY IND; TOHO

GAS KK (JP); OSAKA GAS CO LTD) 25 March 1992 (1992-03-25)

D5: US-B1-6 316 134 (EICHE MICHAEL ET AL) 13 November 2001 (2001-11-13)

D6: NADAL M ET AL: 'Development of a hybrid fuel cell/battery powered electric vehicle' INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, ELSEVIER SCIENCE PUBLISHERS B.V., BARKING, GB, Vol. 21, No. 6, June 1996 (1996-06), pages 497-505, XP004174980 ISSN: 0360-3199

D7: US-A-5 944 878 (LINDHE CURT) 31 August 1999 (1999-08-31)

D8: DE 199 02 219 C (DAIMLER CHRYSLER AG) 8 June 2000 (2000-06-08)

#### 2. Amendments

The amendments submitted with the letter of 17 March 2004

International application No. PCT/EP 03/05272

meet the requirements of PCT Article 34(2). The amendments relate to the combination of claims as submitted in the original and the addition of claims based on page 9 of the description. The amendments with respect to the description relate to acknowledging the prior art and bringing the description into line with the new claims.

#### 3. Novelty

The subject matter of claims 1-15 is considered novel (PCT Article 33(1) and (2)) for the following reasons:

Document D1 discloses an air filter system for low temperature catalytic processes, e.g. fuel cells. A wide variety of particles and gases/steams are filtered out of the incoming air (page 1, lines 13-24). The filters differ from one another in the disclosed system in physical or particle filters and chemical filters. The filters are connected in series in a housing (page 3, lines 12ff.). The filters can be designed as a panel or also as a cylinder (figures 2, 3). The physical or particle filters can be connected in series with different degrees of fineness. The chemical filter is designed according to the requirements, and acid or basic filters for neutralisation are indicated as examples, as well as pure adsorbents or oxidising filters (pages 8-12). If the toxic material in the air supplied falls below a specific concentration, the chemical filter is regenerated by spontaneous desorption (page 11, line 28).

Since the prior art does not disclose any monitoring of the filter system or concomitant initiation of the regeneration process, the subject matter of independent method claim 1, independent product claim 5 and of all the dependent claims is considered novel (PCT Article 33(1),

International application No. PCT/EP 03/05272

### 4. Inventive step

The subject matter of claims 1-15 involves an inventive step (PCT Article 33(3)).

- 4.1 The technical problem addressed by the present application is the preparation of gases, specifically ambient gases, by a filter system for subsequent use in a fuel cell and controlled regeneration of said filter system.
- 4.2 This problem is known in the prior art, but solved in a different manner see point 3, document D1.
- 4.3 Document D6 discloses a fuel cell in a motor vehicle whose incoming air is likewise filtered, compressed and monitored. The pressure difference and flow rate serve as measured variables (page 501, first paragraph).

Document D3 discloses the use of rough and fine particle filters for cleaning process gases for fuel cells.

Document D4 discloses the combination of a filter and a compressor for the preparation of the process gases for a fuel cell.

Document D5 likewise discloses the combination of a filter and a compressor for the preparation of the oxidant for a fuel cell.

Document D7 discloses a filter system consisting of particle filters and chemical filters for the preparation of ambient air for an enclosed space. The filters in question use a wide variety of techniques for filtering substances, for example adsorption via van der Waal

International application No.
PCT/EP 03/05272

forces, molecular sieves, polar or acid or basic molecules, etc.

Document D8 discloses a fuel cell whose incoming air is filtered.

4.4 Proceeding from the closest prior art (D1) and the further disclosures (see point 4.3), the subject matter of claims 1 and 5 cannot be derived from the present prior art. No document - either alone or in combination with a further document - suggests monitoring the effect of the filter by a sensor which, when a desired value is not reached, triggers the regeneration of the filter via a control mechanism. The subject matter of the present application is therefore deemed inventive.

### 5. Certain published documents (PCT Rule 70.10)

Patent no. Publication date Filing date Priority date

WO02054521 11.07.2002 21.12.2001 29.12.2000

Document D2 discloses a fuel cell for use in a motor vehicle and a method for operating same. A wide variety of particles and gases/steams are filtered out of the air that is taken in (page 2, lines 20ff.). The filters are connected in series in a housing and can be expanded as required to form an n-stage multifunction filter. The particle filters can be connected in series with varying degrees of fineness, and the chemical filter is designed as an adsorption filter. The disclosure of D2 will be relevant to novelty in the European phase.

### 6. Industrial applicability

The subject matter of the present application is

International application No.
PCT/EP 03/05272

| industrially applicable in the field of fuel cell |
|---|
| technology in motor vehicles.                     |
|   |
| ·   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |
|   |